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Claims:

1. A method for producing hyperpolarized ^{129}Xe comprising
 - 5 a) preparing a mixture of xenon, ~~an~~ ^{at least one} additive and a free radical
 - b) hyperpolarizing said mixture according to the DNP method to obtain hyperpolarized ^{129}Xe and
 - c) optionally separating said xenon from the other components of the mixture.
- 10 2. A method according to claim 1 wherein the additive is ^{at least one} solvent or a mixture of solvents which has good glass-forming properties and/or lipophilic properties.
- 15 3. A method according to claim 1 and ², wherein the additive is ^{at least one} solvent or a mixture of solvents ^{is} selected from the group consisting of straight chain or branched C₆-C₁₂-alkanes, C₅-C₁₂-cycloalkanes, fatty alcohols, fatty esters, substituted benzene derivatives, mono- or polyfluorinated solvents, single chained alcohols and glycols.
- 20 4. A method according to claims 1 to ² ³ wherein the mixture in step a) is prepared from liquid xenon.
- 25 5. A method according to claims 1 to ⁴ ³ wherein the mixture in step a) is prepared by condensing xenon gas on the top of the additive and the free radical, warming the components until xenon and the additive are in a liquid state and mixing the components until a homogeneous mixture is obtained.
- 30 6. A method according to claims 1 to ⁵ ⁴ wherein in step b) ^{129}Xe is directly hyperpolarized.
7. A method according to claims 1 to ⁶ ⁵ wherein in step b) the NMR active nuclei of the additive are hyperpolarized and this polarization is subsequently transferred to ^{129}Xe by a cross-polarization sequence.

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8. A method according to claims 1 to 7 wherein xenon enriched with ^{129}Xe is used.

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9. A method according to claims 1 to 8 wherein in step c) xenon is separated from the other components of the mixture by warming the mixture until xenon is in the gas state and collecting said xenon in a suitable container.

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10. A method for the production of a contrast agent comprising
a) preparing a mixture of xenon, ^{④ insect} an additive and a free radical
b) hyperpolarizing said mixture according to the DNP method to obtain hyperpolarized ^{129}Xe
c) separating said xenon from the other components of the mixture, and
d) optionally condensing the separated xenon again.

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11. Use of DNP - hyperpolarized ^{129}Xe ^{produced according to the method of} ^{claims 1 to 8} for the manufacture of a contrast agent for the use in magnetic resonance imaging of the human or non-human animal body, preferably of the lungs of the human or non-human animal body.